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10/520,623	01/10/2005	Takeshi Aso	040302-0454	9757

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EXAMINER	
ENIN-OKUT, EDU E	
ART UNIT	PAPER NUMBER
1795	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/520,623	ASO ET AL.	
	Examiner	Art Unit	
	Edu E. Enin-Okut	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 September 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-31* is/are pending in the application.

4a) Of the above claim(s) *1-16* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *17-31* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

FUEL CELL SYSTEM AND CONTROL METHOD

Detailed Action

1. The amendments filed on September 22, 2008 were received. Applicant cancelled claims 1-16 and added claims 17-31. Claims 17-31 are now pending.

Specification

2. The objections to the disclosure are withdrawn due to amendments made that address the issues raised in the previous Office Action.

Claim Objections

3. The objections to claims 1 and 6 are withdrawn because claims 1 and 6 were cancelled.

Claim Rejections - 35 USC § 102

4. The rejection of claims 1-12 and 14-16 under 35 U.S.C. 102(b) as being anticipated by Nonobe is withdrawn because claims 1-12 and 14-16 were cancelled.

5. Claims 17-28 and 30-31 are rejected under 35 U.S.C. 102(b) as being anticipated by Nonobe (US 6,158,537).

Regarding claim 17, Nonobe discloses a fuel cell system [power supply system 10] (Abstract) comprising:

- an energy supply comprising a fuel cell [20], a power distributor [relay 42] connected to the fuel cell, and a secondary cell [storage battery 30] connected to the power distributor (9:44-60);

- a load set [motor 32, auxiliary equipment 34] connected to the power distributor (9:54-56); and
- a controller [control unit 50] (9:51-52, 9:59-60).

As to configuring the controller to control the power distributor to warm the energy supply when the fuel cell system is started up, Nonobe discloses that a controller, control unit 50, is constructed as a logic circuit including a microprocessor and a CPU, a ROM, a RAM, and an input/output port (10:14-16). Thus, one of ordinary skill would appreciate that controller of Nonobe is capable of being configured to control the power distributor in order to warm the energy supply as recited by the functional language of this portion of claim 1 because the controller of Nonobe is in communication with the fuel cell system's power distributor and energy system (9:32-36, 9:51-52, 9:59-60).

However, Nonobe does disclose that the controller [control unit 50] is configured to control the power distributor [relay 42] to warm a vehicle's energy supply [storage battery 30 and fuel cells 20] upon its start-up (i.e., when the vehicles starter switch is switched on) (9:32-33, 12:64-13:14).

As to the functional language recited in claim 1 describing how the controller is to warm the energy supply (see p. 29, lines 10-16 of Applicant's disclosure), one would appreciate that the controller of Nonobe is capable of being configured to alternatively repeat the steps recited by the functional language of this portion of claim 1 because the controller of Nonobe is configured to control the power distributor (9:51-52, 9:59-60).

Regarding claim 18, Nonobe discloses that the load set comprises auxiliary equipment [34] for power generation of the fuel cell (8:62-9:5).

Regarding claims 19, Nonobe discloses a remaining charge monitor 46, e.g., a voltage sensor or a SOC meter, which measures the power charge of the secondary cell [storage battery 30]. One would appreciate that the controller of Nonobe is capable of being configured to control the first power of the

energy supply of Nonobe, as recited by the functional language of claims 3, because all the structural limitations upon which this claim depends have been taught by Nonobe. See MPEP 2114.

Regarding claim 20, Nonobe discloses a detection system [temperature sensor] configured to detect a first temperature of the fuel cell (13:7-10) and a second temperature of the secondary cell (14:56-58). One would appreciate that the controller of Nonobe is capable of being configured to have the first power of the energy supply of Nonobe increase, as the first temperature is lower in rising speed than the second temperature; and the second power decrease and the third power increase, as the first temperature is higher in rising speed than the second temperature, as recited by the functional language of claim 4, because all the structural limitations upon which this claim depends have been taught by Nonobe. See MPEP 2114.

Regarding claim 21, Nonobe discloses a controller [control unit 50] in communication with a SOC [SOC meter] of the secondary cell [storage battery 30] (10:6-11). Therefore, one would appreciate that that the controller of Nonobe is capable of being configured to determine a first power of its energy supply within a limited range depending on an SOC of the secondary cell, as recited by the functional language of claim 5, because all the structural limitations upon which this claim depends have been taught by Nonobe. See MPEP 2114.

Regarding claims 22-27, one would appreciate that the controller of Nonobe can be configured to perform the steps recited by the functional language of claims 22-27, because all the structural limitations upon which these claims depend (i.e., see claim 2) have been taught by Nonobe. See MPEP 2114.

Regarding claim 28, Nonobe discloses that the auxiliary equipment comprises an oxidizer supply configured to supply an oxidizer to the fuel cell [air compressor 66] (8:63-66).

Further, one would appreciate that the controller of Nonobe is capable of being configured to increase power consumption at the oxidizer supply [air compressor 66] for the oxidizer to be supplied by an increased flow rate at an increased pressure, to increase the fourth power, as recited by the functional

language of claim 5, because all the structural limitations upon which this claim depends have been taught by Nonobe. See MPEP 2114.

Regarding claim 30, one would appreciate that the controller of Nonobe can be configured to perform the steps recited by the functional language of claim 14, because all the structural limitations upon which this claim depends (i.e., see claim 2) have been taught by Nonobe. See MPEP 2114.

With respect to claim 31, it has been held that, to be entitled to weight in method claims, the recited structure limitations therein must affect the method in a manipulative sense, and not to amount to the mere claiming of a use of a particular structure (e.g., *Ex parte Pfeiffer*, 135 USPQ 31 (BPAI 1961)). It should be noted that the structure recited in the preamble of this claim has been addressed above with respect to claim 1.

As to steps recited in the claim, Nonobe discloses a control method comprising:

- when the fuel cell [20] is started up (12:64-13:14), controlling the power distributor [relay 42] to warm the energy supply by alternatively repeating a first power distribution [IF4] and a second power distribution [IF1+IB1] (10:66-11:13, 11:52-60);
- wherein the first power distribution unit has a first power generated at the fuel cell [IF4] and distributed to the secondary cell [IB4<0]and the load set [It4] (11:52-60); and
- wherein the second power distribution [IF1+IB1] has a combination of a second power generated at the fuel cell [IF1] and third power discharged from the secondary cell [IB1], distributed to the load set [motor 32, auxiliary equipment 34] (10:66-11:13).

Claim Rejections - 35 USC § 103

6. The rejection of claim 13 under 35 U.S.C. 103(a) as being unpatentable over Nonobe in view of Mufford et al. is withdrawn because claim 13 was cancelled.

7. Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nonobe as applied to claims 17-28 and 30-31 above, further in view of Mufford et al. (U.S. Patent No. 6,186,254).

Nonobe is applied and incorporated herein for the reasons above.

Regarding claim 29, Nonobe discloses that the auxiliary equipment further comprises a cooling system [water pump] configured for a water cooling of the fuel cell, with a cooling water line (8:66-9:3).

However, Nonobe does not expressly disclose the cooling system with a radiator provided with a cooling fan, and a bypass member to bypass the radiator.

Mufford teaches a temperature regulating system for a fuel cell powered electric motor vehicle for maintaining fuel cell stack temperature within a temperature range that provides satisfactory cell performance (Abstract). The fuel cell stack 30 includes a coolant inlet port 45 and a coolant outlet port 50 (3:63-67). A plurality of cooling medium conduits or pipes 55 define a coolant path through which the cooling medium flows between the coolant outlet port 50 of the fuel cell stack 30 and the coolant inlet port 45 (4:5-8). The cooling medium also next encounters a bypass valve 100 that controls coolant flow to a radiator 105 and a radiator bypass path 110 (4:53-55). Coolant passing through the radiator 105 is cooled by air flow over the radiator 105, via the use of a variable speed fan 115 or the like (5:8-12).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include the radiator, cooling fan and bypass member in the fuel cell system of Nonobe because Mufford teaches that their inclusion can ensure satisfactory stack performance by regulating the stack temperature.

Further, that artisan would also appreciate the controller of Nonobe, as modified by Mufford, is capable of being configured for operation of its bypass member to increase power consumption at the cooling fan, to increase the fourth power, as recited by the functional language of claim 29, because all the structural limitations upon which this claims depends have been taught by Nonobe and Mufford. See MPEP 2114.

Response to Arguments

8. Applicant's arguments filed September 22, 2008 have been fully considered but they are not persuasive.

9. As to Applicant's argument with respect to the Nonobe reference, Nonobe teaches the following:

> "When the power supply system 10 *is started* [emphasis added] next time, that is, when the predetermined start switch included in the starter unit 44 is turned on in the vehicle with the power supply system 10 mounted thereon, the on/off switches 38 and 40 and the relay 42 make a connection in the circuit. This enables the storage battery 30 in the sufficient charge state to drive the motor 32 and the auxiliary machinery 34, while the fuel cells 20 output the electric current according to the warm-up state and eventually reach the stationary state. In order to control the operating state of the fuel cells 20 during warm-up, a temperature sensor for measuring the internal temperature of the fuel cells 20 is disposed in the fuel cells 20, and the control unit 50 receives measurement data from the temperature sensor. The control unit 50 gradually increases the flows of gases supplied to the fuel cells 20 according to the warm-up state of the fuel cells 20, so that the fuel cells 20 can gradually increase its output in progress of the warm-up. …" (12:64-13:14)

One would readily appreciate that, when the starter switch of the vehicle of Nonobe is turned on, this is indicative of the start-up of the fuel cell system, as described above. Therefore, Applicant's arguments with respect this reference are unpersuasive.

Conclusion

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Correspondence / Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Edu E. Enin-Okut** whose telephone number is **571-270-3075**. The examiner can normally be reached on Monday - Thursday, 7 a.m. - 3 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dah-Wei Yuan can be reached on 571-272-1295. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Edu E. Enin-Okut/
Examiner, Art Unit 1795

/Dah-Wei D. Yuan/
Supervisory Patent Examiner, Art Unit 1795